

Abstract

In an ESD protection circuit, diodes for shunting current through an ESD clamp include a third terminal in order to provide a dual current path through the diode structure and provide for a voltage drop to the input of the protected internal circuit. In another embodiment, where a bipolar junction transistor is used as an ESD clamp to shunt current to ground between an I/O pad and an input to a protected internal circuit, a lower voltage is provided to the internal circuit by providing a voltage drop across an internal resistive element of the bipolar junction transistor. This is achieved by making use of two base terminals, one connected to the I/O pad, and the other connected to the input of the internal circuit and spaced from the first contact by the base polysilicon region of the bipolar junction transistor.